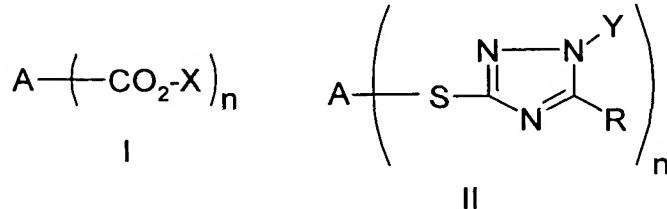


CLAIMS

We claim:

1. Photopolymerizable colorant compounds having Formulas I and II:



5

wherein

A, is a mono-, di-, tri- or tetravalent chromophore;

X is -R₁-O-Q or the photopolymerizable group -CH₂-C₆H₄-p-

C(R₂)=CH₂;

10 Y is -R₁-O-Q, -CH₂-C₆H₄-p-C(R₂)=CH₂ or Q;

R is selected from hydrogen, C₁-C₆ alkyl, aryl and C₃-C₈ cycloalkyl;

R₁ is selected from C₂-C₈ alkylene, -(CH₂CH₂O)_m-CH₂CH₂- and
1,4-cyclohexylenedimethylene;

R₂ is selected from hydrogen and C₁-C₆ alkyl;

15 n is 1 to 4;

m is 1 - 3;

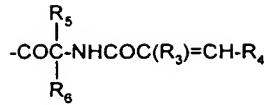
Q is a photopolymerizable group selected from an organic radical
having the formula:

Ia -COC(R₃)=CH-R₄

IIa -CONHCOC(R₃)=CH-R₄

IIIa -CONH-C₁-C₆-alkylene OCOC(R₃)=CH-R₄

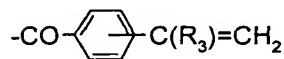
IVa



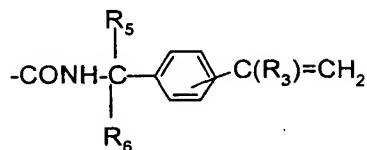
Va



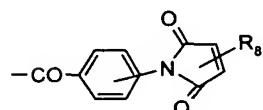
VIa



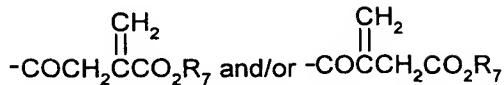
VIIa



VIIIa



IXa



wherein

R_3 is selected from hydrogen or $C_1 - C_6$ alkyl;

R_4 is selected from hydrogen; $C_1 - C_6$ alkyl; phenyl substituted with one or more groups selected from $C_1 - C_6$ alkyl, $C_1 - C_6$ alkoxy, $-N(C_1 - C_6 \text{ alkyl})_2$, nitro, cyano, $C_2 - C_6$ alkoxy carbonyl, $C_1 - C_6$ alkanoyloxy and halogen; 1- and 2-naphthyl; 1- and 2-naphthyl substituted with $C_1 - C_6$ alkyl or $C_1 - C_6$ alkoxy; 2- and 3-thienyl; 2- and 3-thienyl substituted with $C_1 - C_6$ alkyl or halogen; 2- and 3-furyl; and 2- and 3-furyl substituted with $C_1 - C_6$ alkyl;

R_5 and R_6 are independently selected from hydrogen, $C_1 - C_6$ alkyl, substituted $C_1 - C_6$ alkyl; aryl; or R_5 and R_6 may be combined to represent a $-(-CH_2)_3-$ radical;

5 R_7 is selected from hydrogen or a group selected from $C_1 - C_6$ alkyl, substituted $C_1 - C_6$ alkyl, $C_3 - C_8$ alkenyl, $C_3 - C_8$ cycloalkyl and aryl; and
 R_8 is selected from hydrogen, $C_1 - C_6$ alkyl and aryl.

2. Photopolymerizable colorant compounds according to Claim 1
wherein A represents a mono-, di-, tri- or tetravalent residue of a
10 chromophore selected from anthraquinone, anthrapyridone, anthrapyridine,
anthrapyrimidine, anthrapyrimidone, isothiazoloanthrone, azo, bis-azo,
methine, bis-methine, coumarin, 3-aryl-2,5-dioxypyrroline, 3-aryl-5-
dicyanomethylene-2-oxypyrroline, perinone, quinophthalone,
phthalocyanine, metal phthalocyanine, nitroarylamine and a
15 2,5-diarylaminoterephthalic ester residue.

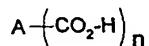
3. Photopolymerizable colorant compounds according to Claim 2
wherein X and Y, respectively, are selected from $-CH_2CH_2OQ$, $-$
 $CH_2CH(CH_3)OQ$, $-(CH_2CH_2O)_{1-2}CH_2CH_2OQ$, $-CH_2C(CH_3)_2CH_2OQ$, and
20 $-CH_2-C_6H_{10}-CH_2OQ$ and A is an anthraquinone, anthrapyridone or
anthrapyridine residue or a 2,5-diarylaminoterephthalate chromophore
residue.

4. Photopolymerizable colorant compounds according to Claim 2
25 wherein Q is $-COCH=CH_2$ or $-COC(CH_3)=CH_2$.

5. Photopolymerizable colorant compounds according to Claim 2
wherein X is selected from $-CH_2-C_6H_4-4-C(R_2)=CH_2$ wherein R_2 is hydrogen
of methyl; and $-R_1-O-Q$ wherein R_1 is selected from $-(CH_2)_{2-4}-$,
30 $-CH_2CH(CH_3)-$, $-CH_2C(CH_3)_2CH_2-$, $-(CH_2CH_2O-)_1-2CH_2CH_2-$,

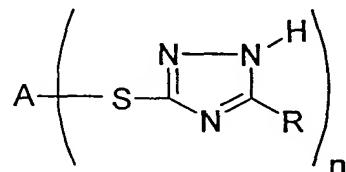
-CH₂CH(OH)CH₂-, and CH₂-C₆H₁₀-4-CH₂-; and Q is selected from
-COC(R₃)=CH₂ wherein R₃ is hydrogen or methyl; or
-CONHC(CH₃)₂-C₆H₄-4-C(CH₃)=CH₂.

5 6. Process for the preparation of the photopolymerizable colorants defined in Claim 1 having Formula I wherein X is a p-vinylbenzyl radical having the formula -CH₂-C₆H₄-p-C(R₂)=CH₂ which comprises reacting colored acidic compounds having the structure:



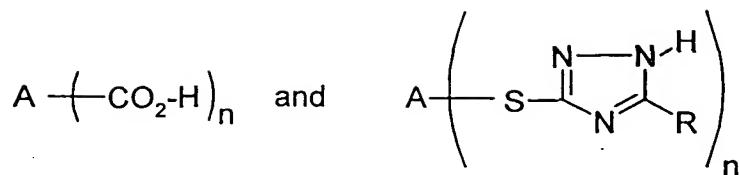
10 with a compound having the structure ClCH₂-C₆H₄-p-C(R₂)=CH₂ in the presence of base.

7. Process for the preparation of the photopolymerization colorants defined in Claim 1 having Formula II wherein Y is a p-vinylbenzyl radical having the formula -CH₂-C₆H₄-p-C(R₂)=CH₂ which comprises reacting colored acidic compounds having the structure



20 with 4-chloromethylstyrene compounds having the structure ClCH₂-C₆H₄-p-C(R₂)=CH₂ in the presence of a base.

8. Process for the preparation of the colored photopolymerizable compounds defined in Claim 1 having Formula I and Formula II wherein X and Y are -CH₂CH₂-O-Q or -CH₂CH(CH₃)-O-Q, which comprises the steps of:
(a) reacting colored acidic compounds having the structures:



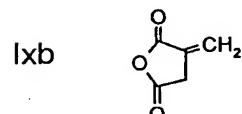
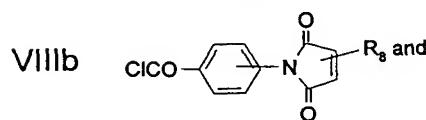
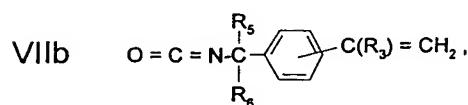
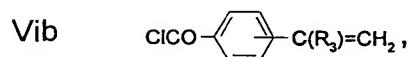
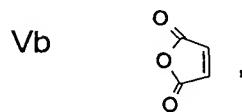
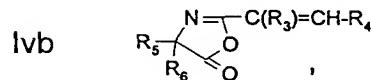
with at least about n molecular equivalents of ethylene or propylene carbonate for each molecular equivalent of acidic compounds to produce
 5 the 2-hydroxyalkyl derivatives of said acidic compounds;

(b) reacting said colored 2-hydroxyalkyl derivatives with about n molecular equivalents of one or more acylating agents having the structures:

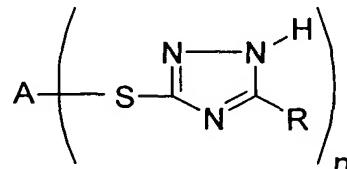
Ib $CICOC(R_3) = CH-R_4$ or $O[COC(R_3) = CH-R_4]_2$,

lib $O=C=N-COC(R_3) = CH-R_4$,

IIIb $O=C=N-C_1-C_6$ alkylene $OCOC(R_3) = CH-R_4$,



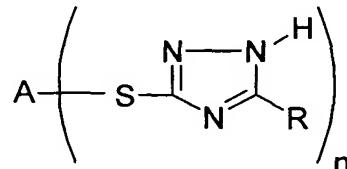
9. Process for the preparation of the colored photopolymerizable compounds defined in Claim 1 having Formula II wherein Y is a photopolymerizable group Q which comprises reacting a colored acidic compound having the structure:



5

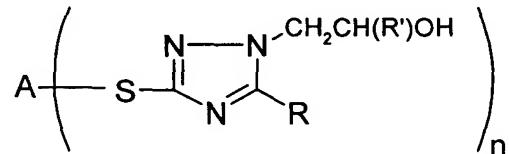
with at least about n molecular equivalents of an acylating agent selected from acylating agents Ib through IXb of Claim 7.

10 10. Process for the preparation of the colored photopolymerizable compounds defined in Claim 1 having Formula II wherein Y is a photopolymerizable group Q which comprises the steps of:
(a) reacting a colored acidic triazolylthio compound having the structure:



15

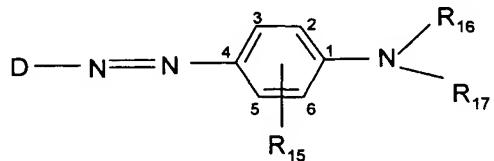
with at least about n molecular equivalents of ethylene or propylene carbonate to produce a hydroxyalkyl compound having the formula



20 wherein R' is hydrogen or methyl, and

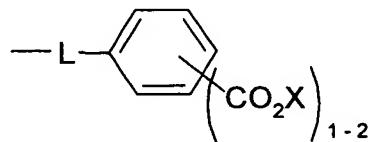
(b) reacting the hydroxyalkyl compound produced in step (a) with an acylating agent selected from acylating agents Ib through IXb of Claim 8.

5 11. A photopolymerizable azo colorant compound defined in Claim 5 having the formula



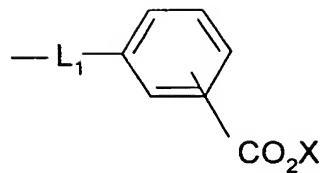
wherein

10 D is a diazo component selected from aryl and heteroaryl groups wherein the aryl and heteroaryl groups are unsubstituted or substituted with C₁-C₆ alkyl, C₁-C₆ alkoxy, C₁-C₆ alkylthio, halogen, C₂-C₆ alkoxy carbonyl, formyl, C₂-C₆ alkanoyl, dicyanovinyl, trifluoromethyl, cyano, carbamoyl, -CONH-C₁-C₆ alkyl, sulfamoyl, -SO₂NH-C₁-C₆ alkyl, phenylazo, 15 phenylsulfonyl, fluorosulfonyl, benzoyl, C₁-C₆ alkylsulfonyl, nitro, -CO₂X and



wherein L is a linking group selected from -O-, -S- and -SO₂-;

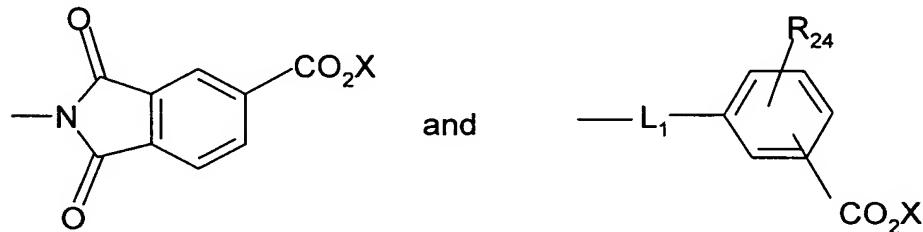
15 R₁₅ is selected from hydrogen or 1 or 2 groups selected from C₁-C₆ alkyl; C₁-C₆ alkoxy; halogen; -NHCOR₂₂, -NHCO₂R₂₂, and -NHSO₂R₂₃ wherein R₂₂ is selected from hydrogen, C₁-C₆ alkyl, and aryl and R₂₃ is selected from C₁-C₆ alkyl, and aryl; wherein the C₁-C₆ alkyl groups represented by R₂₂ and R₂₃ may be substituted with C₁-C₆ alkoxy, aryl, cyano, halogen, C₂-C₆ alkanoyloxy, -CO₂X or



wherein L_1 is selected from a covalent bond, -O-, -S-, -SO₂-, -SO₂NH- and -CONH-;

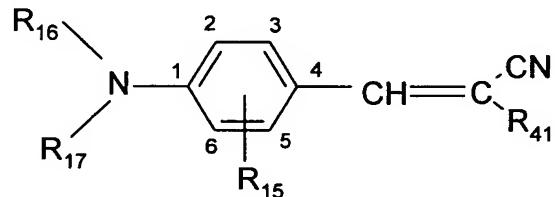
5 R_{16} and R_{17} are independently selected from hydrogen, C₁-C₆ alkyl, cyclohexyl, aryl, C₁-C₆ alkyl substituted with 1 or 2 groups selected from aryl, C₁-C₆ alkoxy, cyano, -OCO-C₁-C₆-alkyl, halogen, succinimido, phthalimido, -CO₂X,

10



12. A photopolymerizable methine colorant compound defined in Claim 5 having the formula

15

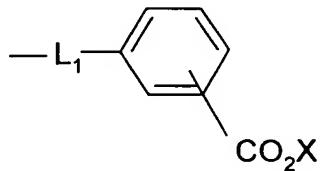


wherein

20 R_{15} is selected from hydrogen or 1 or 2 groups selected from C₁-C₆ alkyl; C₁-C₆ alkoxy; halogen; -NHCOR₂₂, -NHCO₂R₂₂, and -NHSO₂R₂₃

wherein R_{22} is selected from hydrogen, C_1-C_6 alkyl, and aryl and R_{23} is selected from C_1-C_6 alkyl and aryl; wherein the C_1-C_6 alkyl groups represented by R_{22} and R_{23} may be substituted with C_1-C_6 alkoxy, aryl, cyano, halogen, C_2-C_6 alkanoyloxy, $-CO_2X$ or

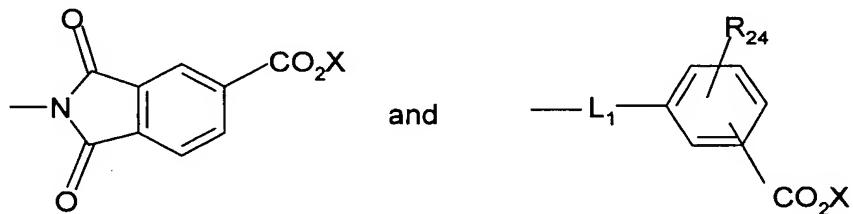
5



wherein L_1 is selected from a covalent bond, $-O-$, $-S-$, $-SO_2-$, $-SO_2NH-$ and $-CONH-$;

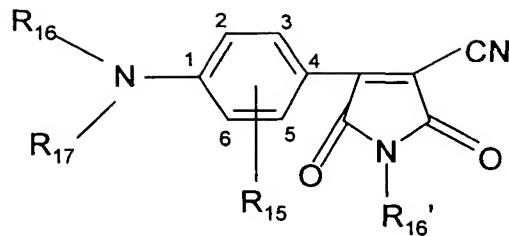
10 R_{16} and R_{17} are independently selected from hydrogen, C_1-C_6 alkyl, cyclohexyl, aryl, C_1-C_6 alkyl substituted with 1 or 2 groups selected from aryl, C_1-C_6 alkoxy, cyano, $-OCO-C_1-C_6$ -alkyl, halogen, succinimido, phthalimido, $-CO_2X$,

15



R_{41} is selected from cyano, $-CO_2-C_1-C_6$ -alkyl, aryl, heteroaryl, $-SO_2-C_1-C_6$ -alkyl, $-SO_2$ -aryl, and $-CO_2X$.

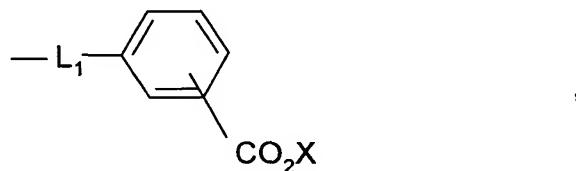
13. A photopolymerizable 3-aryl-2,5-dioxopyrrolidine colorant compound
20 defined in Claim 5 having the formula



wherein

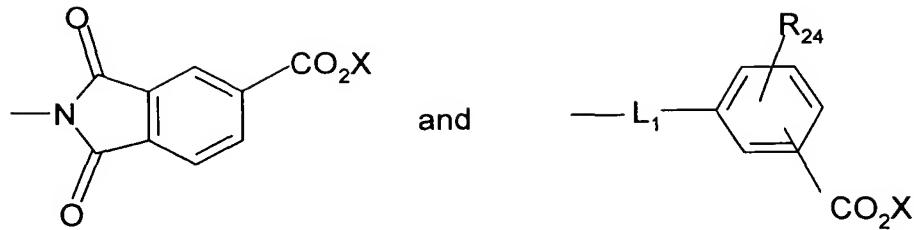
5 R_{15} is selected from hydrogen or 1 or 2 groups selected from C_1-C_6 alkyl; C_1-C_6 alkoxy; halogen; $-NHCO_2R_{22}$, $-NHCO_2R_{22}$, and $-NSO_2R_{23}$ wherein R_{22} is selected from hydrogen, C_1-C_6 alkyl, and aryl and R_{23} is selected from C_1-C_6 alkyl and aryl; wherein the C_1-C_6 alkyl groups represented by R_{22} and R_{23} may be substituted with C_1-C_6 alkoxy, aryl, cyano, halogen, C_2-C_6 alkanoyloxy, $-CO_2X$ or

10

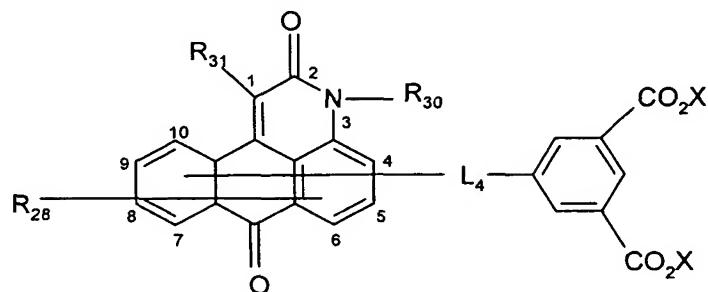


wherein L_1 is selected from a covalent bond, $-O-$, $-S-$, $-SO_2-$, $-SO_2NH-$ and $-CONH-$;

15 R_{16} , R_{16}' and R_{17} are independently selected from hydrogen, C_1-C_6 alkyl, cyclohexyl, aryl, C_1-C_6 alkyl substituted with 1 or 2 groups selected from aryl, C_1-C_6 alkoxy, cyano, $-OCO-C_1-C_6$ -alkyl, halogen, succinimido, phthalimido, $-CO_2X$,



14. A photopolymerizable anthrapyridone colorant compound defined in
Claim 5 having the formula



5

wherein

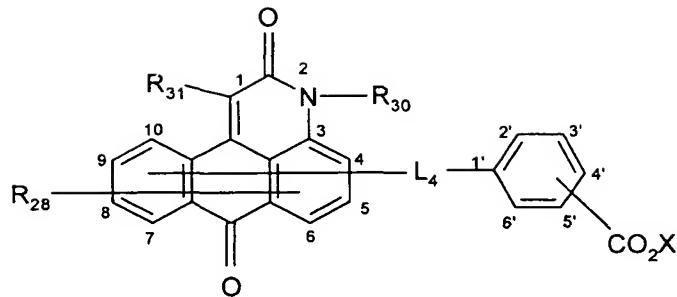
R₂₈ is selected from hydrogen, 4-C₁-C₆ alkoxy, 4-arylthio, 4-aryloxy, 4-C₁-C₆ alkylthio, 4-C₁-C₆ alkylsulfonyl, 4-arylsulfonyl, and 4-halogen;

10 R₃₀ is selected from hydrogen, C₁-C₈ alkyl, substituted C₁-C₈ alkyl, and aryl;

R₃₁ is selected from hydrogen, cyano, C₁-C₆ alkoxy, C₁-C₆ alkylthio, halogen, C₁-C₆ alkylsulfonyl, arylsulfonyl, aryl, arylthio, heteroaryl, heteroarylthio, C₂-C₆ alkoxy carbonyl, and aroyl; and

15 L₄ is selected from 6-NH- and 6-S-.

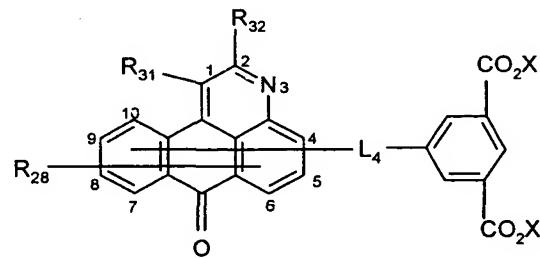
15. A photopolymerizable anthrapyridone colorant compound defined in
Claim 5 having the formula



wherein

R_{28} is selected from hydrogen, 4-C₁-C₆ alkoxy, 4-arylthio,
5 4-heteroarylthio, 4-aryloxy, 4-C₁-C₆ alkylthio, 4-C₁-C₆ alkylsulfonyl,
4-arylsulfonyl, and 4-halogen;
 R_{31} is selected from hydrogen, C₁-C₈ alkyl, substituted C₁-C₈ alkyl,
and aryl;
 R_{30} is selected from hydrogen, cyano, C₁-C₆ alkoxy, C₁-C₆ alkylthio,
10 halogen, C₁-C₆ alkylsulfonyl, arylsulfonyl, aryl, arylthio, heteroaryl,
heteroarylthio, C₂-C₆ alkoxy carbonyl, and aroyl; and
 L_4 is selected from 6-NH- and 6-S-.

16. A photopolymerizable anthrapyridine colorant compound defined in
15 Claim 5 having the formula



wherein

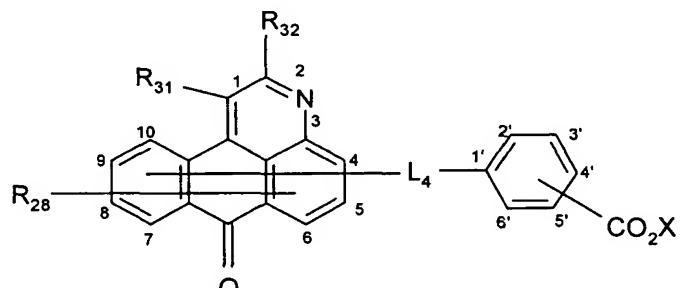
R_{28} is selected from hydrogen, 4-C₁-C₆ alkoxy, 4-arylthio, 4-aryloxy,
20 4-C₁-C₆ alkylthio, 4-C₁-C₆ alkylsulfonyl, 4-arylsulfonyl, and 4-halogen;
 R_{31} is cyano;

R_{32} is $-N(R_{33})R_{34}$ wherein R_{33} and R_{34} are independently selected from C_1-C_6 alkyl, C_1-C_6 alkyl substituted with C_2-C_6 alkanoyloxy, C_1-C_6 alkoxy, and aryl or $-N(R_{33})R_{34}$ collectively may be morpholino, piperidino, or pyrrolidino; and

5 L_4 is selected from 6-NH- and 6-S-.

17. A photopolymerizable anthrapyridine colorant compound defined in Claim 5 having the formula

10



wherein

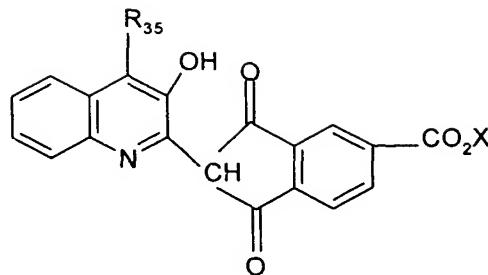
R_{28} is selected from hydrogen, $4-C_1-C_6$ alkoxy, 4 -arylothio, 4 -aryloxy, $4-C_1-C_6$ alkylthio, $4-C_1-C_6$ alkylsulfonyl, 4 -arylsulfonyl, and 4 -halogen;

15 R_{31} is cyano;

R_{32} is $-N(R_{33})R_{34}$ wherein R_{33} and R_{34} are independently selected from C_1-C_6 alkyl, C_1-C_6 alkyl substituted with C_2-C_6 alkanoyloxy, C_1-C_6 alkoxy, and aryl or $-N(R_{33})R_{34}$ collectively may be morpholino, piperidino, or pyrrolidino; and

20 L_4 is selected from 6-NH- and 6-S-.

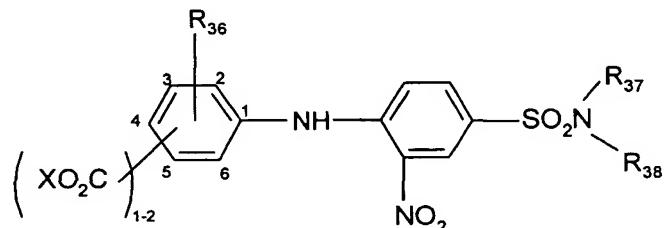
18. A photopolymerizable quinophthalone colorant compound defined in Claim 5 having the formula



wherein R₃₅ is selected from hydrogen, bromo, arylthio, heteroarylthio, and arylsulfonyl.

5

19. A photopolymerizable nitroarylamine colorant compound defined in Claim 5 having the formula



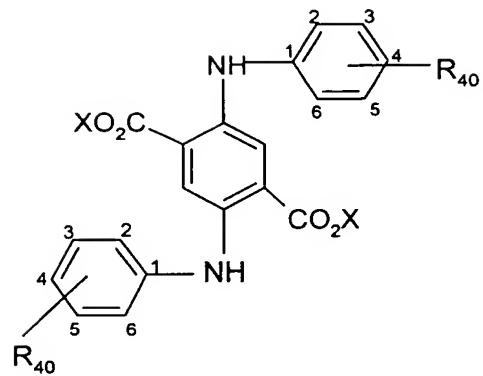
10

wherein

R₃₆ is selected from hydrogen, C₁-C₆ alkyl, C₁-C₆ alkoxy, and halogen; and

15 R₃₇ and R₃₈ are independently selected from hydrogen, C₁-C₆ alkyl, substituted C₁-C₆ alkyl, and aryl.

20. A photopolymerizable 2,5-diarylaminoterephthalate colorant compound defined in Claim 5 having the formula



wherein R₄₀ is selected from hydrogen, C₁-C₆ alkyl, C₁-C₆ alkoxy, and halogen.